MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 3, 2016/2017

PMT0104 – FUNDAMENTAL MATHEMATICS 1

(All sections / Groups)

30 MAY 2017
9 a.m – 11 a.m
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This question paper consists of TWO (2) printed pages with 4 questions only.
2. Answer all FOUR (4) questions.
3. Write all your answers in the answer booklet provided.
4. Only NON-PROGRAMMABLE calculators are allowed.

Question 1 (25 Marks)

a) Perform the indicated operations and simplify the following expression as a single quotient with positive exponents.

i. $\sqrt[4]{\frac{512x^5y}{2xy^9}}$ **(4 marks)**

ii. $\frac{\left(x+\frac{1}{y}\right)\left(x-\frac{1}{y}\right)}{\left(y+\frac{1}{x}\right)\left(y-\frac{1}{x}\right)}$ **(4 marks)**

iii. $\left(\frac{x^2-16}{9x^2-1}\right) \div \left(\frac{x^2+3x-4}{3x^2-2x-1}\right)$ **(4 marks)**

iv. $\frac{4}{\sqrt[3]{py}}$ **(4 marks)**

b) Simplify each expression and write in the standard form $a + bi$.

i. $(4+i)^3$ **(4 marks)**

ii. $\frac{(3-2i)(8+2i)}{2(1+i)}$ **(5 marks)**

Question 2 (25 Marks)

a) Solve the following equations:

i. $\frac{4}{x-2} = 10$ **(3 marks)**

ii. $(2x)(4x-15) = -27$ **(4 marks)**

iii. $\sqrt{2x+9} + \sqrt{x+5} - 2 = 0$ **(8 marks)**

b) Solve the following inequalities:

i. $|2x-3| > 5$ **(4 marks)**

ii. $\frac{3}{(x-5)(x+5)} \leq 0$ **(6 marks)**

Continued...

Question 3 (25 Marks)

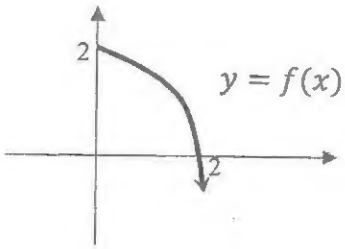
a) If $f(x) = 3x - 1$ and $g(x) = 2x + 3$, find the following:

i. $(f + g)(4)$ **(3 marks)**

ii. $(fg)(2)$ **(4 marks)**

iii. $(f \circ g)(1)$ **(4 marks)**

b) Given the following graph $y = f(x)$,



i. Estimate $f(0)$ and $f(2)$. **(2 marks)**

ii. What is the domain and range of $f(x)$? **(2 marks)**

c) Find the inverse of the following function.

i. $f(x) = x^2 + 2$ **(5 marks)**

ii. $f(x) = \dfrac{2x}{x+1}$ **(5 marks)**

Question 4 (25 Marks)

a) Given a geometric progression: 3, 6, 12, ……, find the sum from the 3rd term to the 10th term of the geometric progression. **(6 marks)**

b) The eleventh term of an arithmetic sequence is 30 and the sum of the first eleven terms is 55. What is the common difference? **(6 marks)**

c) Given 2 lines $y + 2x + 4 = 0$ and $-8x + 4y = 4$.

i. Find the point of intersection between these 2 lines. **(6 marks)**

ii. Determine whether the lines parallel, perpendicular or neither both? **(4 marks)**

d) Find the distance of the line segment whose endpoints are (-3, 4) and (5,4). **(3 marks)**

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